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[DIVISION OF ORNITHOLOGY AND
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United States Department of Agriculture.

Division of Economic Ornithology and Mammalogy.

DIRECTIONS FOR COLLECTING THE STOMACHS OF BIRDS.

In studying the habits of birds in order to understand their relation to agriculture, their food is one of the most important points to be considered. Trustworthy information as to the food-habits of birds is welcomed from any source, but even the best field naturalists are likely to make mistakes so long as they trust only to observations on the living bird, and persons of less experience make such mistakes more frequently.

On the other hand there is little chance of error if the contents of the throat, crop, stomach, and gizzard can be examined carefully, especially when this is done by persons skilled in the work and having every appliance for it. Such an examination made in the field as soon as a bird is shot would afford the most convincing proof as to the character of its food, but for obvious reasons field examinations seldom are practicable. It is easy, however, to preserve in alcohol the food found in birds, and subsequent examination of this material in the laboratory gives excellent results.

The Department of Agriculture therefore desires to get as many stomachs as possible of each species of bird, not only of those which are supposed to be mainly beneficial or mainly harmful, but also of those which as yet are not known to belong to either class.

Under ordinary circumstances the Department does not advise or approve the killing of birds solely to study their stomach contents, nor can it authorize anyone to collect birds for this or any other purpose in violation of local laws. However, many birds may be killed lawfully at certain seasons, and most States make provision for collecting specimens for scientific purposes at other seasons, and for killing any birds actually injuring crops. In most cases the stomachs of such specimens might be preserved with little extra trouble, though now, as a rule, they are not saved. Could the Department of Agriculture obtain in good

condition even one-half the stomachs of the birds prepared annually by taxidermists and collectors in the United States, it would have ample material for settling many of the most important questions relating to the practical value of birds.

The Department will be glad to pay all reasonable expenses for the preservation and transportation of such material, and in order to secure the material in good condition, and at the same time save the collector as much trouble as possible, the following directions and suggestions have been prepared:

IDENTIFICATION.

In order to be of any value it is absolutely necessary that stomachs should be positively identified. The Latin names of birds, though best, are not necessary, provided a distinctive name is given. But such bare names as blackbird, wood-pecker, thrush, and sparrow, are useless, for the simple reason that several species are included under each; nor are the terms "Swamp Blackbird," "Common Wood-pecker," and "Ground Sparrow" sufficient. If the true name of any bird killed is not known, the head, wings, and tail may be forwarded in one of the penalty envelopes supplied for the purpose; such specimens will be named at once and returned if desired. This costs the sender nothing, gives him the correct name of the bird, and gives the Department a stomach of positive value. Except in decidedly cold weather, never send a *whole* bird, unpreserved, by mail.

METHOD OF PREPARATION.

1. Remove the stomach as soon as possible after killing, taking care not to cut through its walls, or to cut the gullet or intestine so short as to let the stomach contents escape. In case such an accident occurs, wrap the stomach in a bit of cloth and tie with thread. Now attach to each stomach a tag bearing a number, and keep a list (on blanks supplied for the purpose) of the numbers with the corresponding names, dates, and localities. In numbering the stomachs use the tags supplied, or any strong linen paper. Make the numbers distinctly, using a hard lead pencil or india ink, best, as all ordinary inks fade in alcohol. Let the ink dry thoroughly before it is wet with alcohol. It is best to sew tags on the stomachs with needle and strong thread, running it directly through the walls of the stomach.

2. Sometimes a bird's mouth and gullet as well as the gizzard or stomach contain food, and very often the crop contains more than mouth, gullet, and stomach combined. Save all of food the bird contains, either putting a tag on each separate part, or wrapping all together in cloth and putting one tag on the package. If crop, gullet, and stomach are tagged separately, put the same number on all the tags, and note in the column for remarks that there are three packages for that bird. If making a collection of bird skins and numbering the skins, the same numbers may be used for the stomachs; otherwise the first stomach collected should be marked No. 1, and the rest in the order in which they are collected.

3. Keep at hand a small, wide-mouthed bottle, and drop into it the small stomachs as soon as the tags are dry and the numbers recorded, pouring in enough strong alcohol to cover them. Get the strongest alcohol obtainable (90 to 95 per cent.) and use it full strength at first. When the bottle is half full of stomachs, transfer them to a quart or two-quart fruit jar and cover with fresh alcohol somewhat diluted (about 1 part water to 2 parts strong alcohol). Large stomachs may

go into large jars at once, and will need more alcohol in proportion. When two or three jars are full, or the collection is complete, pack the jars carefully in a strong wooden box, using hay, excelsior, or crumpled paper (not sawdust) for packing, and forward by express (see under 25), addressed ORNITHOLOGIST, DEPARTMENT OF AGRICULTURE, WASHINGTON, D. C., *charges collect*. Send the *list* of stomachs by mail, accompanied by a statement of the items of expense incurred for alcohol and jars, and the total amount will be refunded.

4. Glass fruit jars with covers made tight by rubber bands will cost from 8c. to 15c. each, according to size, style, and the number bought at once. The best alcohol should not cost more than 75c. per quart, or \$2.50 per gallon; if it cannot be had at about that price, or if it is probable that more than a single gallon will be required, the Ornithologist should be notified. Keep all jars containing alcohol tightly covered to prevent evaporation. So long as it keeps its strength it will have a peculiar stinging odor; when this is lost it is good for nothing.

5. Stomachs may be sent safely by mail, a few at a time, if the following directions are observed. When the stomachs are well cured (ten days in good alcohol will suffice for small stomachs), take them out of alcohol, drain for a few moments, and then wrap in paper or cloth and mail in a small box of wood or tin (a common spice box answers perfectly for most purposes). By using an official envelope postage is not required.

6. In case a collector should wish to examine the contents of the stomachs for himself before forwarding to the Department, it is best to put the contents of each stomach into a separate vial after examination, but in such cases a numbered tag should be put *inside* each vial, as anything gummed or tied on the outside is likely to be rubbed off and lost. If proper care is used the contents of a stomach may be wrapped in cloth, and after tying securely with thread it can be tagged and treated like an unopened stomach, thus avoiding the use of a vial.

7. It should be remembered that remarks by the collector as to the exact locality in which a bird was shot, the kind of food it appeared to be taking, the abundance of certain kinds of fruit, seeds, or insects in the vicinity, and similar notes, may be very important and save much valuable time to the examiner. It should be noted also whether the bird is a nestling, a bird fully grown but not matured, or an adult, perhaps feeding young of its own.

8. If specimens are taken during migration, and under such circumstances as to make it probable that they have just arrived from the north or south, this fact should be noted, for such stomachs may contain food which has been brought a long distance, and perhaps seeds which might grow wherever dropped.

9. In case birds are seen eating particular kinds of food, animal or vegetable, one or more samples of this food would be very acceptable, with or without stomachs of the birds. Such samples can be numbered, listed, and bottled with the stomachs, or in many cases they can be sent by mail in envelopes or boxes, either fresh or after drying.

10. The Division of Ornithology is making a collection of the seeds and fruits of plants, for reference in determining those found in bird's stomachs. This collection as yet is very imperfect, and any contributions to it will be gratefully received. The seeds and fruits most desired are those on which birds are likely to feed, but any seeds of native or naturalized plants which are carefully identified will be very acceptable.

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